



What is claimed is:

(five times amended)

A process for overmolding tubes comprising the steps of:

- inserting a tube of a first polymer, having an inner diameter, at least partially into a mold and at least partially onto a cylindrical mandrel, the mandrel having a base and a tip, an outer diameter of said mandrel dimensioned so as to allow the inner diameter of the tube to slide thereon, said mold containing a void for receiving a second polymer, the void co-acting with the mandrel and the tube to define an overmolding shape;
- injection molding the second polymer over the tube and the mandrel in the void of the mold; and
- crosslinking the first and second polymers independently to an initial degree, and
- independently crosslinking said polymers to a higher final degree.

63. The process of claim 1 wherein

the overmolding shape comprises

- a sealing surface region at the base of the mandrel and
- a tube contacting region adjacent thereto.

64. The process of claim 1 wherein

- the overmolding shape comprises an internally threaded engaging surface region at the base of the mandrel and
- a tube contacting region adjacent thereto.

65. The process of claim 1 wherein

- the overmolding shape comprises an externally threaded engaging surface region at the base of the mandrel and
- a tube contacting region adjacent thereto.

66. (amended)

The process of claim 1 wherein

- the first and second polymers are polyethylene.

67.(amended)

The process of claim 66 wherein

an initial degree of crosslinking of each of the first and second polymers is in the range of from about 35% to about 50% and the final degree of crosslinking of each of the first and second polymers is greater than or equal to about 50%.

68. The process of claim 63 wherein

the sealing surface region is selected from the group consisting of a cup-shaped void and a radiused void; and wherein the tube contacting region is an essentially tubular void.

69. The process of claim 68 wherein

the tube further comprises an annular shelf interposed between the sealing surface region and the tube contacting region.

70. The process of claim 64 wherein

the internally threaded engaging surface region is an internally threaded annular void; and wherein the tube contacting region is an essentially tubular void.

71. The process of claim 70 wherein

the tube further comprises a n-sided shelf interposed between the internally threaded engaging surface region and the tube contacting region and wherein n is an integer value greater than or equal to 4.

72. The process of claim 65 wherein

the externally threaded engaging surface region is a threaded annular void; and wherein the tube contacting region is an essentially tubular void.

73. The process of claim 72 wherein

the tube further comprises a n-sided shelf interposed between the externally threaded engaging surface and the tube contacting region and wherein n is an integer value greater than or equal to 4.

74. The process of claim 1 wherein
the tube further comprises a mesh overbraid applied prior to the injection molding step.
75. The process of claim 63 which further comprises
the step of inserting a nut onto the tube after the step of injection molding.
76. The process of claim 63 which further comprises the step of
molding a retaining ring onto the first polymer tube by heating a portion of the tube posterior to the nut and
compressing at least one end of the tube along a longitudinal axis of the tube, a mandrel having been inserted into the tube prior to the step of compressing.
77. The process of claim 66 wherein
the first polymer is a high density polyethylene and
the second polymer is a low density polyethylene.
78. The process of claim 66 wherein
the first polymer is a low density polyethylene and
the second polymer is a high density polyethylene.
79. The process of claim 1 wherein
at least one of the first and second polymers is at least partially crosslinked before the step of crosslinking.
80. The process of claim 1 wherein
an initial degree of crosslinking of the first polymer is less than an initial degree of crosslinking of the second polymer.
81. A process for overmolding tubes comprising the steps of:
inserting a tube of a first polymer having a first polymer initial degree of crosslinking, said first polymer having an inner diameter, at least partially into a mold and at least partially onto a cylindrical mandrel, the mandrel having a base and a tip, an outer diameter of said mandrel dimensioned so as to allow the inner diameter of the tube to slide thereon, said mold containing a void for receiving a second

polymer, the void co-acting with the mandrel and the tube to define an overmolding shape;

injection molding a second polymer having a second polymer initial degree of crosslinking, said initial degrees of crosslinking being selected independently for the first and second polymers, over the tube and the mandrel in the void of the mold; and crosslinking the first and second polymers to a final degree, said final degree of crosslinking for the first and second polymers being selected independently for the first and second polymers.

82. The process of claim 81 wherein
an initial degree of crosslinking of each of the first and second polymers is in the range of from about 35% to about 50% and the final degree of crosslinking of each of the first and second polymers is greater than or equal to about 50%.
83. The process of claim 81 wherein
the first polymer is a high density polyethylene and
the second polymer is a low density polyethylene.
84. The process of claim 81 wherein
the first polymer is a low density polyethylene and
the second polymer is a high density polyethylene.
85. The process of claim 81 wherein
an initial degree of crosslinking of the first polymer is less than an initial degree of crosslinking of the second polymer.
86. The process of claim 81 wherein
the overmolding shape comprises
a sealing surface region at the base of the mandrel and
a tube contacting region adjacent thereto.
87. The process of claim 81 wherein
the overmolding shape comprises an internally threaded engaging surface region at the base of the mandrel and
a tube contacting region adjacent thereto.

88. The process of claim 81 wherein
the overmolding shape comprises an externally threaded engaging
surface region at the base of the mandrel and
a tube contacting region adjacent thereto.
89. The process of claim 81 wherein
the first and second polymers are polyethylene.
90. The process of claim 89 wherein
an initial degree of crosslinking of each of the first and second polymers is
in the range of from about 35% to about 50% and the final degree
of crosslinking of each of the first and second polymers is greater
than or equal to about 50%.
91. The process of claim 86 wherein
the sealing surface region is selected from the group consisting of a cup-
shaped void and a radiused void; and wherein
the tube contacting region is an essentially tubular void.
92. The process of claim 91 wherein
the tube further comprises an annular shelf interposed between the
sealing surface region and the tube contacting region.
93. The process of claim 87 wherein
the internally threaded engaging surface region is an internally threaded
annular void; and wherein
the tube contacting region is an essentially tubular void.
94. The process of claim 93 wherein
the tube further comprises a n-sided shelf interposed between the
internally threaded engaging surface region and
the tube contacting region and wherein n is an integer value greater than
or equal to 4.
95. The process of claim 88 wherein
the externally threaded engaging surface region is a threaded annular
void; and wherein
the tube contacting region is an essentially tubular void.

96. The process of claim 95 wherein
the tube further comprises a n-sided shelf interposed between the
externally threaded engaging surface and
the tube contacting region and wherein n is an integer value greater than
or equal to 4.
97. The process of claim 81 wherein
the tube further comprises a mesh overbraid applied prior to the injection
molding step.
98. The process of claim 81 which further comprises
the step of inserting a nut onto the tube after the step of injection molding.
99. The process of claim 81 which further comprises the step of
molding a retaining ring onto the first polymer tube by heating a portion of
the tube posterior to the nut and
compressing at least one end of the tube along a longitudinal axis of the
tube, a mandrel having been inserted into the tube prior to the step
of compressing.
100. The process of claim 81 wherein
at least one of the first and second polymers is at least partially
crosslinked before the step of crosslinking.
101. The process of claim 81 wherein
an initial degree of crosslinking of the first polymer is less than an initial
degree of crosslinking of the second polymer.